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ON THE

# TEMPERATURE OF THE BODY

AS A MEANS OF

DIAGNOSIS AND PROGNOSIS IN PHTHISIS.



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IN

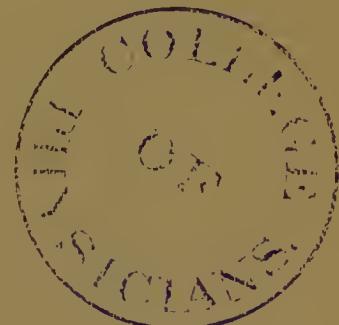
## PHTHISIS

BY

SYDNEY RINGER, M.D.,

PROFESSOR OF MATERIA MEDICA AND THERAPEUTICS AT UNIVERSITY COLLEGE;  
PHYSICIAN TO UNIVERSITY COLLEGE HOSPITAL.

Second Edition.



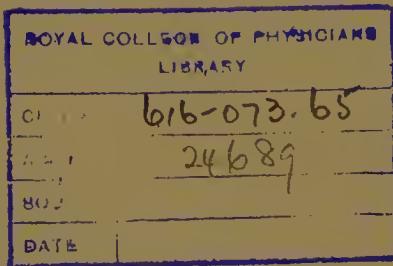
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INTRODUCTION.

Two reasons influence the author to publish this second edition. First and chiefly because since the publication of the first edition our knowledge of phthisis has extended, so that it has become necessary to modify the phraseology to suit the altered pathological views. Thus, when the first edition was written, all forms of phthisis were considered to be due to two forms of tubercle, miliary or grey tubercle and yellow tubercle. At that time catarrhal or scrofulous pneumonia was not recognized. The lung induration forming that kind of phthisis now called fibroid lung was at that period attributed always to tubercle, and was supposed to indicate an effort to heal the destruction caused by it, indeed regarded as cicatrized tissue.

The second reason is that my little book has been curiously misread or perverted. It would seem indeed that some authors who have cited my views can hardly have read my book. Thus to select one instance from several:—Dr. Bathurst Woodman in his excellent translation of Wunderlich on Temperature says “I am loth to differ from Dr. Ringer but if I understand

him aright that there is an elevation of temperature in all cases of tubercular deposit, I am compelled to do so, if that statement be intended to apply at all times after the deposit of tubercle has once taken place." Now the main object of my work was to show the very reverse of what is here attributed to me. I had sought to prove that the temperature is raised only during the formation of the deposit, and that when this ceased then the temperature became normal; and that these thermometric indications afforded a delicate and a valuable test of the continuance, the amount, and the cessation of the tuberculization. A test, too, of scrofulous pneumonia, which when my book was issued had not been differentiated from tubercle. The very first proposition formulated in my former work says "there is probably a continued elevation of the temperature of the body in all cases in which a deposition of tubercle *is taking place* in any of its organs;" and further on it is said "In two of the remaining cases not only was there no elevation of the temperature but no increase could be detected in the physical signs, and on making the *post-mortem* examination the tubercle was found to have undergone retrograde changes and to have become obsolescent. No recent tubercle was found. Thus in the case of Cove, the cavities in both lungs were surrounded by thick tough fibrous walls and the grey granulations were shrunken, causing slight puckering of the surrounding lung tissue, extremely hard, and for the most part enclosed in their centre a small amount of cretaceous matter, they, moreover, contained and were immediately surrounded by much black pigmentary matter. The lung tissue also between them was tough and fibrous. Thus in all the cases observed in which the deposition of tubercle was going on, there was a continued elevation of the

temperature, whilst in those cases *in which the deposition of tubercle had ceased the temperature was normal.*"

At page 5 it is stated "it is probable that by means of the temperature we can conclude that the deposition of tubercle has ceased, and that any physical signs that are present are due to obsolescent tubercle and chronic thickening of the lung tissue between the tubercular deposits." Again a few pages further on we say that "in those cases in which the temperature becomes and remains normal the deposition of tubercle ceases." In fact on almost every page similar statements are to be found.

Clinically we recognize three forms of phthisis, catarrhal or scrofulous pneumonia, true tubercle, and the fibroid lung. These are the three forms of phthisis with which we have to do in this work. Scrofulous pneumonia affects the minute bronchial tubes and air vesicles. True tubercle the blood-vessels, lymphatic vessels and glands, and the connective tissue corpuscles. The fibroid lung is a hyperplasia of the connective tissue, the new tissue being imperfectly developed.

Thus in catarrhal or scrofulous pneumonia there is catarrh of the smaller bronchial tubes extending to the air vesicles. The thick tenacious mucus blocks up the minute bronchial tubes and produces collapse of the vesicles, and their vessels becoming bent and twisted the circulation is impeded, whence results oedema, and following this, induration and pigmentation. Through the catarrh of the air vesicles their cavities become filled with low formed cells, these accumulations either soften and rapidly lead to excavation, or becoming inspissated and undergoing fatty degeneration they form those cheesy masses which may become cretaceous, but more generally soften and

slowly form cavities. The cavities, cheesy masses, and obstructed bronchial tubes, act as irritants, causing hyperplasia of the contiguous connective tissue, thus producing one form of fibroid lung. In severe cases of phthisis with rapid formation of cavities and breaking down of the lungs, the air vesicles in very large numbers are mainly involved.

True tubercle consists of small rounded bodies varying in size from an almost imperceptible point to that of a large pin's head, generally pretty equally scattered through the lungs, often affecting many other structures, and in the disseminated form mostly occurring in children. Tubercles are probably produced by proliferation of the connective tissue corpuscles, or of the cells around small arteries and veins, situated most likely in the perivascular canals; or of the cells of the lymphatic vessels, or of those minute lymphatic glands which Dr. Sanderson has shown exist naturally in the lungs. According to the old views, still held by some excellent pathologists, these "grey granulations" may undergo fatty degeneration, and become opaque and then soften and lead to cavities. These bodies often become obsolescent.

The foregoing forms of lung disease are intimately associated, and pathologists now commonly teach that both forms may be generally found associated. Thus during the formation of tubercles the active cell growth involves the cells lining the air vesicles, thus producing catarrhal or scrofulous pneumonia. On the other hand the cheesy masses of catarrhal pneumonia, acting as centres of infection, induce a local and even general deposition of tubercle.

It is true that catarrhal pneumonia and tubercle are now differentiated into distinct diseases, but when the first edition of this book was issued they were considered identical. Now

as these diseases generally co-exist they will for the most part be spoken of together, so that only slight verbal alterations are necessary on account of our new pathological knowledge.

In fibroid phthisis portions of the lung become indurated by the formation of large quantities of low-formed connective tissue. It may originate in different ways, but is generally a consequence of catarrhal pneumonia. Thick tough walls surround the cavities, and indurations form between them and the cheesy masses. Fibroid phthisis extends often, slowly, generally by means of catarrhal pneumonia or the formation of small quantities of tubercle in the neighbourhood of the indurated lung. Sometimes fibroid phthisis spreads slowly, unhelped by these incidents. At other times the cavities dry up, the indurated tissue ceases to extend, and contracts when the lung may be considered healed. In a case like this the induration may truly be considered cicatricial.

In this edition the original number of cases, twenty-four, cited in the first edition is retained. A large number of cases, carefully observed during many subsequent years, serve but to confirm the author's original investigations.

In the following pages the terms fever, and elevation of temperature are used synonymously.



THE  
TEMPERATURE OF THE BODY IN PHthisis.

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In the first edition of this work the following propositions were laid down.

1. There is probably a daily elevation of the temperature of the body in all cases in which a deposition of tubercle is taking place in any of its organs.
2. This elevation of the temperature is probably due either to the general condition of the body (tuberculosis) or to the deposition of tubercle in its various organs (tuberculization.)
3. This elevation is probably due to the general condition (tuberculosis) rather than to the deposition of the tubercle (tuberculization.)
4. The temperature may be taken as a measure of the amount of the tuberculosis and tuberculization; and fluctuations in the temperature indicate corresponding fluctuations in the severity of the disease.
5. The temperature is a more precise indication of the amount of tuberculosis and tuberculization than either the physical signs or symptoms.
6. By means of the temperature we can, in many instances, diagnose tuberculosis and tuberculization long before the physical signs and symptoms are sufficient to justify such a diagnosis.
7. By means of the temperature we can diagnose tuberculosis, even when during the whole course of the disease there are no physical signs indicative of tubercular deposit in any of

the organs of the body, and when the symptoms (apart from the temperature) are inadequate, to enable us to arrive at such a diagnosis.

8. It is probable that by means of the temperature we can conclude that the deposition of tubercle has ceased, and that any existing physical signs are due to obsolescent tubercle and chronic thickening of the lung between the tubercular deposit.

If catarrhal or scrofulous pneumonia are included in each of the foregoing propositions, then, with slight alterations hereafter to be noticed, and perhaps some modification of the third proposition, the author can confidently state that after a pains-taking and prolonged investigation they may be relied upon as trustworthy.

These propositions will now be considered severally.

1. There is probably a daily unnatural elevation of temperature in all cases during the continuance of catarrhal pneumonia or whilst a deposition of tubercle is taking place in any of the organs of the body.\*

In the first edition twenty-four carefully observed cases were recorded, to these I could, if necessary, now add very many

\* The expression "continued" used in the first edition instead of daily was perhaps unfortunate and gave rise to some misapprehension. It is not meant that during the whole period of the disease the temperature is unnaturally high, and never at any period of the day becomes normal, but merely, that on each day there is a preternatural rise. The term "continued" was employed in the sense in which it is applied to typhoid fever, where at the end of the attack the temperature falls daily to the natural standard. The author's meaning, however, is obvious on reference to the numerous charts given in the first edition. In this paragraph we have used the qualifying word "unnatural" to exclude those fluctuations of temperature which occur daily to a slight degree in healthy adults and to a marked extent among children.

more. In twenty-one of these twenty-four cases there was a daily elevation of the temperature of the body, and the deposition of tubercle was proved either during life by an increase of the physical signs, or after death by the *post-mortem* appearances; or by both means.

In one of the three remaining cases no increase of the physical signs was detected during the brief stay of the patient in the Hospital, but on her return after an absence of some weeks, the physical signs had increased. In this case the temperature was but slightly elevated. In the remaining two cases there was not only no elevation of the temperature, but no detectable increase in the physical signs, and the *post-mortem* examination revealed the fact that the diseased products had undergone retrograde changes. No recent tubercle nor catarrhal pneumonia was found, the cavities in both lungs were surrounded by thick tough and fibrous walls, and the small round bodies, either obsolescent tubercle, or thickening around minute bronchial tubes, causing slight puckering of the surrounding lung tissue, were extremely hard, and for the most part enclosed in their centre a small amount of cretaceous matter. They, moreover, contained and were immediately surrounded by much black pigmentary matter and the interposed lung tissue was tough and fibrous. The author's further investigations supported by those of other observers, show, however, that in some cases of tuberculization or of catarrhal pneumonia there may be no elevation of the temperature. Thus in tubercular meningitis it is by no means uncommon, though it certainly is not the rule for the temperature to remain normal throughout the course of the attack or at all events during most of the latter part of it. In some cases the temperature is slightly elevated for a short period and then

becomes natural, or even falls below the normal point. In by far the greater number of instances the temperature is elevated, sometimes very considerably reaching  $105^{\circ}$  to  $108^{\circ}$  Fah.

There are two feasible explanations of this phenomenon either or both of which are tenable. We may suppose that in certain parts of the nervous system as yet unknown the deposition of tubercle may prevent a rise of temperature; or that during the tubercular deposition a rise of temperature occurred before timely observations were made, and that afterwards no further deposition took place; the patient dying from the effect of the tubercle deposited before the temperature was noted. The former is probably the true interpretation; for in some cases, observed from nearly the commencement, the temperature in the rectum remained normal throughout the attack. In these non-febrile cases of acute miliary tuberculosis the author believes that generally but little tubercle will be found beyond the brain and its membranes.

It has been asserted that during acute miliary tuberculosis of the lungs, the temperature in rare instances may remain normal. With regard to this statement the author believes that unless the deposit of tubercle has gone on by very slight and scarcely appreciable increments, it had become obsolescent at the time the temperature was first taken, so that the fever stage was overlooked, or else that chronic peribronchitis has been mistaken for true tubercle; a morbid condition due to previous catarrhal pneumonia, causing thickening of the bronchial tubes and neighbouring tissues,\* and constituting the early stage of one form

\* In such cases, on section of the lung we see little groups of hard, often pigmented bodies, whose cross section is round. These were long mistaken for true miliary tubercles.

of fibroid lung, when the acute febrile stage has long passed by. Still it must be admitted that in some very chronic cases, either of tuberculization or catarrhal pneumonia, the disease progresses so slowly and the deposit at any one time is so slight that it is insufficient to elevate the temperature unless very slightly.

Thus we meet with cases in which, some time before death, the temperature was always natural, and yet the *post-mortem* examination reveals much fibroid degeneration from old standing tubercle or catarrhal pneumonia. And adjacent to the fibroid portions, in the otherwise healthy lung tissue, we see a few recent miliary tubercles easily counted, or a few small patches of recent catarrhal pneumonia. Indeed in these diseases we meet with every degree of activity to which the temperature corresponds. In some cases the disease advances so slowly that the temperature is scarcely raised, and we should naturally expect that a very slight amount of morbid action would be insufficient to raise the temperature appreciably. Where there is no elevation of the temperature we may conclude that the progress of the disease is almost insignificant. Although the patient is exposed to the lurking danger that from some slight cause this comparatively harmless condition may be aggravated into a severe and dangerous attack.

In fibroid phthisis the temperature is often normal. It is so in those not unfrequent cases of recovery where, however, the lung so damaged, that it can never regain its natural state, gives morbid physical signs. Again, towards the close of life, in certain chronic cases, the temperature not uncommonly becomes natural and so continues till death, when it is found either that the disease has progressed very slowly or has become stationary but not till the health was irreparably broken or serious secondary diseases were induced.

But a natural temperature is by no means the rule in fibroid phthisis, for there is generally a slight daily rise reaching to  $100^{\circ}$  or  $100\cdot5^{\circ}$  or even  $101^{\circ}$  Fah., and this may recur daily for weeks or months ; or, as commonly happens, such a daily rise may continue for a few days or a fortnight, and then the temperature may again become natural, remaining so for a few days, when another rise continuing several days occurs, and this alternation may endure for months and possibly for years, slowly undermining the health and ultimately causing death.

These kinds of thermometric elevation just described may depend on different causes. They probably result sometimes from simple suppuration or irritation of the walls of the pulmonary cavities. Thus in large discharging surfaces and from large discharging abscesses we get a temperature of the same kind ; and a fibroid lung with large secreting cavities may be compared not inaptly to a discharging psoas abscess. In abscesses the increments in the temperature do not always co-exist with an increase of discharge, nor in fibroid phthisis with increase of the expectoration. Irritation of the walls of an abscess or the pulmonary cavities or perhaps some infection of the system may probably account for these elevations of temperature. In other cases no doubt the rise is due to the slow progress of tuberculosis or catarrhal pneumonia ; if due to tuberculosis it is produced by a small crop of miliary tubercles arising from local infection due to cheesy masses. During the occurrence of these slight attacks of local tuberculization or catarrhal pneumonia the temperature rises slightly and the attacks being frequently repeated we get frequent slight febrile attacks lasting a few days.

Thus we have cases which may be termed mixed, where fibroid phthisis predominates but in which either a slight con-

tinuous extension of catarrhal pneumonia occurs maintaining a constant slightly abnormal temperature, or the disease for a few days becomes too slight to raise the temperature, or indeed ceases altogether. The foregoing remarks renders it obvious that a natural temperature must not lead us to conclude that this disease is not slowly spreading since the amount of tuberculization or of catarrhal pneumonia may be too slight to raise the temperature; moreover fibroid degeneration may probably spread independently of tuberculization and catarrhal pneumonia. Nor do the slight rises show the persistence of catarrhal pneumonia, for these may be due to the same causes which raise the temperature in a similar manner in large discharging abscesses. Probably however, in most cases, these slight daily elevations of the temperature are due to tuberculization or catarrhal pneumonia; and in the early stage of phthisis as after a slight acute attack the disease having nearly subsided without the formation of cavities or small ones only, these rises in the temperature are strongly indicative of the continuance of a slight amount of tuberculization or catarrhal pneumonia.

We will now show that this elevation of temperature is due to the miliary tuberculosis or catarrhal pneumonia. Thus seven of the twenty-four cases reported in the first edition unequivocally support this view, for during the chief part of their course no other disease manifested itself.

Of the remaining cases with high temperature other diseased conditions were present. As these secondary complications, though always slight, may be thought sufficient to account for the elevation of temperature, they will now be considered.

These secondary complications were bronchitis: slight ul-

ceration of the intestines; pneumonia; chronic inflammation of the pharynx and trachea; aphthæ; a trace of albumen in the urine; and in one case some pleural friction, but there were no signs at any time of effusion. In no individual case were all these diseased conditions met with; they were variously and for the most part sparingly mixed in the different patients. In the majority of the cases bronchitis was the only secondary complication.

*Bronchitis.*—To ascertain how far bronchitis is capable of elevating the temperature of the body, observations were made on five\* patients suffering from more or less severe chronic capillary bronchitis; and on one patient who expectorated three quarters of a pint daily, but in whose chest only sonorous and sibilant rhonchus could be detected. None of these cases manifested any elevation of the temperature.

It may be objected that in these cases of bronchitis there was evidence of obstruction to the circulation and want of proper aeration of the blood. This is true to some extent of five of these cases, but in the sixth (and in many more since observed) there was no dyspnœa nor any lividity.

The author therefore thinks that with respect to these cases it is impossible the bronchitis could have caused the elevation of the temperature, especially when it is borne in mind that in many of them the bronchitis was very small in amount; and further, that if different cases of phthisis or different periods of the same case are compared, the elevation of the temperature is in no way proportionate to the amount of bronchitis.

*Albumen.* Did the small amount of albumen in the urine of several of these patients indicate disease of the kidney, and if

\* Since the publication of the first edition these observations have been considerably increased.

so was that disease sufficient to account for the elevation of the temperature? To ascertain how far chronic Bright's disease is capable of affecting the temperature, observations were made on a considerable number of patients suffering from the different chronic forms of this disease which failed to show that any elevation of the temperature took place.\* And it must be borne in mind that fever (*i.e.* elevation of the temperature) often causes a small amount of albumen in the urine without furnishing any reason to suspect kidney disease. In these cases of phthisis wherein albumen was detected, the temperature was considerably elevated, being indeed as high as that attained in scarlet and typhoid fevers, namely from  $103^{\circ}$  to  $105^{\circ}$  Fah. Thus the author thinks he is justified in assuming that the elevation of temperature was not due to the albumen in the urine.

*Ulceration of the Intestines.* The ulceration was not extensive in any of the cases; no case showed more than ten or twelve ulcers; and, indeed, in one case they were much less numerous. It will hardly be thought possible that so slight a lesion could cause an elevation of the temperature so considerable ( $102^{\circ}$  to  $105^{\circ}$  Fah.) as was met with in these cases. That extensive ulceration of the intestines both large and small—ulceration far exceeding that found in any of the other cases—does not necessarily cause elevation of the temperature was well exemplified in one instance which was unaccompanied with fever. It must be further borne in mind that in some of these cases diarrhoea set in only a few days before death, probably

\* Indeed the temperature is generally depressed and in patients dying from uræmic poisoning it may fall to  $92^{\circ}$  Fah. a few hours before death. A like depression sometimes occurs in patients dying comatose in diabetes.

at about the time ulceration commenced, and yet on the onset of the diarrhoea no increase of temperature took place.

*Pneumonia.* It is very improbable that the pneumonia found in certain cases was the cause of the elevation of the temperature persisting throughout the attack, for at the *post-mortem* the pneumonia was found to be slight in amount and manifested all the characters of being recent and gave no evidence of its existence a few days previous to death.

Pneumonia moreover is frequently found in the lungs of persons who have died of various diseases in which cases it is generally admitted to have set in only a very short time before death.

*Chronic inflammation of the pharynx and trachea* can scarcely be considered capable of elevating the temperature to  $103^{\circ}$  and  $105^{\circ}$  Fah. for several weeks. Moreover, other forms of chronic inflammation of these parts fail to increase the temperature, and in cases of non-febrile phthisis we sometimes meet with extensive ulceration of the pharynx and trachea.

*Aphthæ.* It will surely not be maintained that aphthæ could produce so high a temperature; indeed, they did not make their appearance till a few days before death, when a slight decline of the temperature took place.

Thus the author thinks he is justified in assuming that in these cases accompanied with secondary complications, the elevation of the temperature if not entirely, was mainly due to the tuberculosis or catarrhal pneumonia.\*

\* The following paragraph is here re-introduced from the first edition, to show that the author did not at that time consider his cases numerous enough to conclude that there is preternatural elevation of temperature in *every* case of either tuberculosis or catarrhal pneumonia. Time has proved that this caution was not unnecessary, for as has been shown, in

That the elevation of the temperature was due to the phthisis is shown by the correspondence which existed between the elevation of the temperature, and the activity of the lung deposit, estimated by the physical signs, for while the deposition was going on rapidly the temperature was high and *vice versa*.

3. Is this elevation of the temperature due to the general condition, or to the local effects from the formation of tubercle, or of catarrhal pneumonia? If the elevation of the temperature is due to the formation of tubercle or to catarrhal pneumonia, we must admit that the conditions existing during the deposition are far more capable of causing elevation of temperature, than are the conditions existing in closely allied diseases, as inflammation.

Thus we meet with cases of phthisis accompanied with elevation of temperature during several weeks before we get physical signs indicative of the deposition of tubercle, or of consolidation from catarrhal pneumonia, or of any notable increase of already existing consolidation.

For instance, a patient began to be ill towards the latter part of March, but we were unable to detect sufficiently marked physical signs to warrant us in diagnosing phthisis till May 6th, and even on June 12th the physical signs showed only consolidation of the right lung above the clavicle, and on the

some instances, a slight deposition of tubercle, or a very slight amount of catarrhal pneumonia may occur without evident fever. "It thus appears that not only are the conditions existing *during* the deposition of tubercle capable of causing a continued elevation of the temperature; but that it actually does so, if not in all at least in the very great majority of instances, there being no exception to this rule amongst the cases given in this pamphlet."

left side as low as the second rib, and four fingers breadth below the spine of the scapula. Yet during the greater part of this time the temperature varied between  $103^{\circ}$  and  $104^{\circ}$  Fah., and during the whole period it rose daily considerably above the normal temperature. Another patient was taken ill on July 15th, yet we were unable to detect sufficient physical signs to indicate disease of the lungs till August 13th, and on September 6th the physical signs indicated considerable consolidation on the right side of that portion of the lung occupying the supra clavicular and clavicular region and slight consolidation immediately below the clavicle. There was no evidence of consolidation of the left lung. Yet during by far the greater part of this time his temperature rose daily to  $103^{\circ}$  and  $104^{\circ}$  Fah. Another patient was under observation from April 30th to August 18th. On the first named date the physical signs indicated in front, slight consolidation of the right apex and considerable consolidation over the whole of the left side. Behind, some consolidation on both sides as low as the angle of the scapula. At this time there were no evidences of excavation. At the *post-mortem* examination on August 19th, cavities were found in the upper lobes of each lung, and these lobes contained throughout much recent and obsolescent disease. The middle and lower lobes contained only a very few scattered granulations, or points, or catarrhal pneumonia. Yet in this case the temperature rose daily to  $103^{\circ}$  and  $105^{\circ}$  Fah.

It thus appears that a small amount of disease corresponds to a considerable and long sustained elevation of temperature. Experience abundantly confirms this statement, but simple inflammations with a corresponding elevation of the temperature give rise to signs and symptoms indicative of far

greater alterations. Thus croupous pneumonia sufficient to cause an elevation of the temperature equal to that met with in the cases just referred to, would in a few days cause entire consolidation of both lungs.

The author thinks that in proportion to the right he has to argue from such analogy is the probability that the elevation of the temperature is due rather to the general than the local conditions existing in phthisis. . The probable correctness of this inference is strengthened by the fact, that in other diseases, as the specific fevers, where the elevation of the temperature is in excess of the local derangement, we ascribe this elevation to some general cause rather than to the local disturbances. Thus, in typhus, typhoid, and scarlet fevers, we do not attribute the elevation to the rash, sore throat, ulceration of the intestines, but to some general condition ; and the disproportion existing between the elevation of the temperature and the disease in the lungs of phthisis, is quite as great as that between the elevation of the temperature and the rash in typhus fever, the ulceration of the intestines in typhoid fever, and the rash and sore throat in scarlet fever.

4. The temperature may be taken as a measure of the amount of tuberculosis or catarrhal pneumonia, and fluctuations in the temperature indicate corresponding fluctuations in the amount of disease. For, (1) if the elevation of the temperature is due to the disease we should expect there would be a close correspondence between them.

(2) In the case of acute inflammation, or of any of the specific fevers, the temperature is admitted to be an accurate indication of the severity of a given attack.

(3) We actually find that the general symptoms taken collectively do correspond most closely to the temperature of the

body, and that when they are severe the temperature is high and *vice versa*.

(4) The elevation of the temperature closely corresponds to the activity of the deposition of the tubercle and of the amount of catarrhal pneumonia; for in those cases in which the physical signs (corroborated by post mortem examination) denote the disease to be actively progressing the temperature is high and *vice versa*.

In some cases the temperature is elevated considerably and permanently throughout the day, reaching in the evening  $104^{\circ}$  even to  $105^{\circ}$  Fah. and falling but little or scarcely at all in the morning. A temperature like this in tuberculosis indicates a very rapid and wide-spread formation of tubercle, and in catarrhal pneumonia shows that large tracts of lung tissue are implicated, the disease being more marked in the air vesicles than in the small bronchial tubes, the air vesicles becoming distended with diseased products till even large portions of the lung may become consolidated. These diseased products press upon the vessels, prevent the due supply of blood to the consolidated portions; hence these die in their centres, and then soften and form cavities, and in this way in a few weeks the lungs may become riddled with large cavities. This is the temperature characteristic of acute phthisis or galloping consumption.

In other cases, though normal or nearly normal at one period of the day, usually the morning, at another period, usually at night, the temperature rises to a considerable height, reaching  $103^{\circ}$  or  $104^{\circ}$  Fah. This is a common temperature in a moderately severe case of catarrhal pneumonia. In another class of cases the rise is less, not reaching higher than  $102^{\circ}$  Fah. and in some to a point between  $100^{\circ}$  and  $101^{\circ}$

Fah. In these cases of chronic phthisis the disease progresses far more slowly, dragging on for many years, though in these very lingering forms the temperature does not rise daily for the whole period but for a variable time, a few days in some instances, in others for several months it rises daily, then becomes natural for perhaps weeks, months, or years, again rising for a variable period, and this alternation goes on over and over again. In acute cases the temperature sometimes rises daily to a high point ( $103^{\circ}$  to  $105^{\circ}$ ) till death. In other instances it falls a few days before death. In more favourable cases it gradually rises less high, indicating that the activity of the disease is diminishing, and showing that the patient is passing from the acute, into a sub-acute, and then into the chronic form, till at last no fever remains, and then we learn that the physical signs are due to old disease, and that we have a case of fibroid lung mixed up with obsolescent tubercle or cheesy masses. After the temperature has become natural the cheesy masses perhaps soften and lead to the formation of cavities; or in the most favourable cases no more cavities form, old ones dry up and gradually contract, expectoration ceases, symptoms disappear and the patient recovers with only a portion of his lungs permanently disabled. Hence the old view, that fibroid lung is due to a healing effort and may be regarded as cicatricial tissue, is correct in a good many cases.

The thermometer is very useful in cases of the following kind:—A patient previously in good health is seized with pretty copious and repeated haemoptysis, there are no physical signs, and beyond a cough and an elevated temperature of  $102^{\circ}$  or  $103^{\circ}$  there is no other evidence of phthisis. These symptoms however are sufficient to declare the nature of the

case which becomes still more evident when loss of strength and weight, with continued elevation of the temperature, and marked though not extensive physical signs set in. After a month or five weeks the temperature gradually declines, the cough disappears, appetite and strength return, the pulse becomes natural, and but for the assistance of the thermometer it would be inferred that the disease was completely arrested. This instrument however shows that the temperature rises daily over  $100^{\circ}$  and sometimes to  $101^{\circ}$  Fah. A most important revelation; for otherwise, the patient, assuming that the disease had ceased, would be apt to care too little for his health, and thus, from overwork or exposure to cold, the almost arrested disease is very likely to become aggravated into another severe attack. And further, the patient and even the doctor himself, seeing the marked improvement and inferring that the disease has ceased, might conclude that a change of climate, or other health-preserving measure, is unnecessary, whilst a continuous though slight daily rise in the temperature would prove the necessity of unrelaxing care. It is true that convalescence takes place slower whilst the temperature is even slightly raised than when the temperature becomes natural; but it is impossible to judge from the rate of convalescence that the disease is at an end.

5. The temperature is a more accurate indication of the activity of tuberculosis or catarrhal pneumonia than either the physical signs or the symptoms. Thus only a considerable increase in the amount of disease can be detected by physical signs; and in disseminated tuberculosis where the granulations are pretty equally scattered throughout the lungs, and indeed often through most of the organs of the body, there may be entire absence of physical signs. Thus it is

apparent that the physical signs only give us evidence of the continuance of the disease after the lapse of a considerable interval, even in very acute cases. Whilst it has been shown that in almost all cases there is an elevation of the temperature during the deposition of tubercle or the continuance of catarrhal pneumonia, and that the elevation being proportionate to the activity of the disease, the continuation and the amount of disease can at any time be ascertained by the use of the thermometer, except indeed in those very chronic cases where the amount of tuberculization or of catarrhal pneumonia is slight and almost insignificant. When it is thus borne in mind that only considerable deposits in the lungs can be detected by physical signs, while even a small amount will elevate the temperature even considerably for some time, it becomes evident that the temperature is a far better estimate of the amount of mischief than the physical signs. Moreover after tuberculosis or catarrhal pneumonia has ceased, consolidation from the diseased products and from fibroid lung remains, and it is impossible from the physical signs to tell the condition of such a lung, to tell whether disease is progressing or not, whilst the temperature will answer the question for us. If the temperature is natural at all periods of the day, after a few days we may safely conclude that active disease has very nearly or entirely ceased. Of the symptoms in phthisis, though many are more or less constant, still it is well known that none can be relied on implicitly as evidence of the severity or of the continuance of tuberculization or catarrhal pneumonia. For of all the symptoms, perhaps that most relied on is the patient's loss or gain of weight. But the fact of the weight remaining unchanged will not justify us in concluding that there is improvement or

arrest of the disease. Thus in four cases the persistence of the disease was proved by an increase of the physical signs, and yet these patients' weight remained unaltered. Neither does a considerable increase of weight necessarily show the arrest or even any considerable improvement. Nor does a sudden and great loss of weight necessarily indicate any increase in the activity of the disease. Thus a patient lost 8 lbs. between July 16th and July 28th, yet during this period the temperature indicated a less intensity of the disease than on many other occasions.

Moreover weight usually only gives evidence of any fluctuation when observations are made over extended periods ; again the ingestion of food and the state of the bowels materially affect this means of observation, whilst these objections do not apply to the thermometer.

It need hardly be remarked that the weight\* of the patient is chiefly regulated by his appetite ; thus if his appetite remains good the patient may maintain, or even increase his weight, though the disease is sufficient to elevate the temperature as high as it usually reaches in scarlet or typhoid fever, that is to say,  $103^{\circ}$  and  $105^{\circ}$  Fah. On the other hand, immediately the appetite fails, the disease remaining the same, a patient rapidly loses weight and speedily dies ; as might indeed be expected, when it is borne in mind that the elevation of the temperature is due either to perversion of the forces of the body, or to increased consumption of the tissues, most probably, in part at least, to the latter. Yet it must be admitted that, as Dr. Theodore Williams has recently insisted, patients sometimes waste even when the appetite is

\* When not interfered with by diarrhoea or profuse haemoptysis or other occasional causes.

good. In such cases there is great defect in the assimilative process, the digestion remaining good; but usually defective assimilation leads to, or is accompanied with weak digestion and loss of appetite.

Thus considering that the weight is for the most part regulated by the appetite, and that the appetite holds no necessary relationship to the amount of active disease; it is evident that the weight cannot be relied on as a test of the activity of miliary tuberculosis or catarrhal pneumonia.\*

Night sweats are generally considered to be in some measure indicative of phthisis, but though often present, still their presence is not sufficient to prove the existence of, nor their absence, the freedom from, phthisis. Moreover, the amount of sweating affords no evidence of the severity of the disease. There are two chief causes of profuse sweating.

1st. Fever (*i.e.* elevation of temperature) during the decline of which, sweating more or less severe, generally occurs,† and 2nd, general weakness.

\* It is true that patients with a considerable elevation of temperature but who enjoy a good appetite do not usually lose weight, provided however, they are not employed in any active pursuit entailing much waste of tissue. If on the other hand they are actively employed, then the food is insufficient to supply the waste caused by the fever and that due to muscular and mental exertion, hence phthisical patients who follow their occupation are apt to lose weight even when the appetite remains good. It thus follows, in giving an opinion respecting the possible duration of the disease, that the appetite and the degree of rest enjoyed by the patient become of the greatest importance.

† This is less marked in children than in adult. Persons who have resided for some years in a tropical climate acquire as it were on slight provocation a habit of free sweating which continues on their return to temperate climates.

When due to fever the sweating becomes of value in the diagnosis of phthisis; but in many cases it is impossible to decide whether the sweating results from fever, or from debility.

In phthisis the temperature generally, except in the severer cases, falls daily to the normal, or nearly normal standard, and we may therefore have a diurnal attack of sweating; and when the sweating indicates previous elevation of the temperature recurring daily for a considerable time, we are justified in assuming that it is significant of phthisis.

In some cases the distinction between the two kinds of sweating may be discriminated. Thus, when due to fever, the sweating will occur only during its decline, and as we get only one daily rise of the temperature, we consequently have only one paroxysm of sweating in the twenty-four hours. Whilst if the sweating is due to debility, then upon exertion, or during sleep, at any hour of the day, sweating will usually ensue, and therefore we may have several paroxysms of sweating in the course of the twenty-four hours.

But though this difference in the frequency of the attacks of sweating may in some degree serve to guide us in determining their cause, yet too much reliance must not be placed on it; inasmuch as in advanced or severe cases of phthisis both causes exist and consequently, though the frequency of the daily attacks of sweating surely show the presence of debility, they will not prove that the other cause, namely fever, is not also present.

But the absence of sweating is not indicative of freedom from phthisis, for in those forms of it where the temperature remains permanently high, generally no sweating occurs, and further, in some cases, though the daily rise and fall in the

temperature is great and the weakness marked, yet there may be no sweating.

Thus from the frequent impossibility of determining the cause of the sweating and from the fact that the two causes often co-exist, so that it is impossible to discriminate the proportion of the sweating due to fever and that to weakness, to say nothing of determining the amount of the secretion, with anything approaching to accuracy, it becomes apparent that sweating is but of little value as evidence either of the existence of phthisis, or as a measure of its amount.

To what extent can the pulse be relied upon as an indication of the presence and amount of tuberculosis or catarrhal pneumonia, and how far in this respect is it comparable with the temperature?

It is well known that the pulse and temperature generally coincide—alterations affecting the one also influencing the other. When the increased frequency of pulse is due to fever, of course the pulse becomes significant of phthisis. But cases occur marked with a considerable elevation of the temperature, yet the pulse remains normal or nearly so. It is thus evident that a normal frequency of the pulse is not sufficient to prove the absence of fever, and therefore the freedom from tuberculization or catarrhal pneumonia; such cases, however, are uncommon.

But whilst we have generally increased frequency of the

\* It is generally considered that sweating causes much exhaustion. When due to fever (*i.e.* elevation of temperature) much weakness is often the result, not however from the sweating itself but from the increased consumption of tissue which causes the elevation of temperature. When however the sweating does not depend on a previous elevation of the temperature, it must be considered the result and not the cause of the exhaustion.

pulse with an elevation of the temperature, it must be borne in mind that a frequent pulse may be produced by other causes than fever. A common cause of a frequent pulse is debility or exhaustion. Thus frequently during convalescence from acute disease, or even in weakness from chronic disease, the pulse may daily be 100, 120 even 130 without any elevation of the temperature. The pulse may be very frequent, even 160 per minute, in hysteria, though here the frequency is not generally persistent.

We may have often a frequent pulse without any elevation of the temperature, but we have seen that in almost all cases of tuberculization or catarrhal pneumonia there is elevation of the temperature; a continued frequency of the pulse, therefore, though itself a good symptom, cannot be accepted as an unfailing sign of phthisis.

Is there any method of deciding between the increased frequency of the pulse due to fever, and that due to weakness? The author knows of none but the use of the thermometer.

It may be truly said that we generally get increased frequency of the pulse in cases suffering from exhaustion yet convalescent from acute disease; but after such acute diseases phthisis often sets in, when consequently it is of great importance to decide between the causes. No doubt it is true that where the weakness is slowly brought about, the pulse is much less apt to be increased, hence a stedfast augmentation of its beats in a person who has not previously suffered from an acute disease becomes important, for under such circumstances the increase is very probably due to fever, and to some extent is significant of tuberculosis or catarrhal pneumonia, but much doubt on this point must always exist till the body's temperature is ascer-

tained. It follows, therefore, that the pulse is of far less diagnostic value than the temperature in the active stages of phthisis. It is also far inferior as a measure of the activity of the disease; indeed in this respect it is almost useless, for it varies greatly in frequency in different patients, and in the same patient when the temperature stands at the same point. And after tuberculosis or catarrhal pneumonia has ceased and the temperature has consequently become normal, the pulse may still continue frequent for a considerable time. It is so generally admitted that the remaining symptoms cannot be taken as indicative of the activity of the disease that the author thinks it unnecessary to adduce further proof in support of his position that the temperature is a far more delicate measure of the activity of the tuberculosis or catarrhal pneumonia than are either the physical signs or the symptoms, whether the signs and symptoms are taken individually or collectively.\*

6. By means of the temperature we can often diagnose tuberculosis or catarrhal pnemonia long before we can detect any physical signs, and at a period when the symptoms are insufficient to justify such a diagnosis.

With respect to these diseases the author trusts that he has shown that with rare exceptions, which have been duly

\* The collective symptoms certainly very often closely correspond to the activity of the disease and a fair estimate may be obtained from them. But they are so capable of being modified by diarrhoea, the appetite, haemoptysis, that they become much less trustworthy than the temperature (though of great value in forming the prognosis.) Moreover, the temperature can be accurately recorded day by day and we can thus speak precisely and confidently of the activity of the disease which the general symptoms will not enable us to do.

noted, there is a daily state of fever; and very numerous observations now enable him to state that with few exceptions this persistent fever takes place only in tuberculosis, catarrhal pneumonia, large abscesses, rheumatism, ague, and occasionally in syphilis.\* The diagnosis of ague and rheumatism is rarely difficult, the characteristic symptom rendering, in most cases, their identification quite easy. Large superficial abscesses present no difficulty, but it may not be easy to detect deep-seated abscesses; as these abscesses generally arise from diseased bone in the abdominal or pelvic cavities, the diagnosis in some cases is impossible for a considerable time. As a rule, however, they give more or less pain, often to a considerable degree, in the neighbourhood of the abscess or over the spine. Moreover a tumour will generally be detected after the fever, if at all high, has lasted a few weeks. Local symptoms too, as pain on movement, stiffness, lameness, etc., will, in most cases, point out the nature of the disease. Sometimes, however, deep-seated abdominal abscesses run a much more chronic course, the temperature then assuming the character so common in fibroid lung; thus the temperature rises to  $101^{\circ}$  even perhaps to  $102^{\circ}$ , and daily mounts to this height for a few days, then becomes natural for a variable time, but from some cause, as over-exercise, the fever is once

\* Dr. Duffin has reported two interesting cases of febrile syphilis in the Transactions of the Clinical Society.

Empyema, especially when discharging, generally produces a temperature like that described in fibroid lung. An empyema may be compared to a large discharging abscess. Again we meet with cases of extreme dilatation of the bronchi following pleurisy and accompanied by great retraction in which the temperature is like that described in fibroid lung. In such cases there is abundant secretion and expectoration, often coloured red with blood from ulceration of the mucous membrane.

more excited, and the temperature again remains elevated for a week, fortnight, or longer. It is often very difficult to determine the nature of the disease, and to exclude tubercle or catarrhal pneumonia. True there are no pulmonary physical signs, but these may be absent while the local symptoms may be too few to justify the diagnosis of abscess. The author having but a limited experience of deep-seated, subacute abscesses would wish the following remarks to be accepted with caution. In general there is pain in the abdomen, not constant, but brought on by slight walking; sometimes there are marked dyspeptic symptoms, amongst which flatulence predominates. The author is inclined to believe that a slight and daily rise of the temperature continued for a considerable time or running the irregular course just described, if accompanied by deep pain and tenderness in the abdomen, the lungs being free from evidences of disease, will justify the suspicion of a deep-seated, subacute abscess. These rules at all events have enabled him to diagnose doubtful abscesses, when without the thermometer their detection would be impossible. The author leans to the belief that with these abscesses the periods of natural temperature are longer than usually occurs in subacute phthisis; moreover, the rise can sometimes be traced distinctly and repeatedly to over-exercise, a bout of fever accompanied by an increase in the other symptoms occurring after each occasion. Of course, if an abdominal tumour is detectable by the hand, or if there are evidences of diseased spine, then the diagnosis is far more easy.

Again a large discharging sore or a discharging psoas or iliac abscess frequently produces a course of fever like that described under sub-acute and chronic phthisis. In some

cases there is a slight daily elevation lasting for months, in other cases the abnormal temperature continues for only a few days or lasts one or two weeks, and then for a short time falls again, and this alternation may be repeated for a considerable time. Here the diagnosis is easy, for there is a discharging sore with absence of pectoral physical signs or symptoms. In cases of constitutional syphilis with chronic fever the diagnosis in many cases is more difficult, and unfortunately little is known at present of this subject. The temperature may be high, rising to  $103^{\circ}$  and  $104^{\circ}$  Fah. daily; the morning remissions are usually great, the temperature often falling to  $98^{\circ}$ . In these respects the syphilitic fever corresponds to moderately severe cases of phthisical fever. Distinct and easily recognizable constitutional symptoms generally set in concurrently with the fever; or the disease assumes the rheumatic form; and thus the diagnostic difficulty will be, not between phthisis and syphilis but between simple acute rheumatism and syphilis. In some cases the diagnosis has seemed impossible until, on the administration of iodide of potassium,\* the temperature at once became normal, or declined gradually, reaching the temperature of health in one or two weeks.

Assuming the exclusion of the foregoing causes of fever: how long must the elevation of temperature persist before we can with probability suspect tuberculosis or catarrhal pneumonia in cases free from physical signs or characteristic symptoms, as for instance, haemoptysis? The author thinks from ten to twenty days, each day facilitating and strengthening the diagnosis. The diagnosis in the first few days is well-nigh impossible, but each successive day serves to exclude

\* Very large doses may be required.

sources of error. Thus, on the second day, if the rise is due to scarlet fever, its characteristic rash ought to appear; if due to small pox, the rash should appear on the third day; if in measles, about the fourth; and in typhus on the fifth day. Before this time, if the rise is due to acute inflammation of the brain, lungs, kidneys, &c., characteristic symptoms and physical signs will have set in. In most cases of typhoid fever the rose spots will appear between the eighth and tenth day; at this stage we may exclude most cases of simple inflammation which usually decline before the tenth day, when the fever ceases. Thus, on the tenth day, or thereabout, assuming as we have said, the exclusion of the other causes of chronic fever, the diagnosis lies between tuberculosis and typhoid fever. In the early stages the discrimination of one from the other is difficult, and may indeed be impossible. Each begins gradually, and is not usually ushered in with convulsions, chills, or rigors; nor have we in most cases, to assist our judgment, distinctive symptoms, like the back and headache of small-pox, the sore throat of scarlet fever; the coryza and cough in measles, before the advent of the characteristic rashes. It is true that in the beginning of many cases of typhoid fever, before the appearance of the rash, there is diarrhoea and headache, but though these symptoms point strongly to typhoid fever, yet they may be present at the commencement of acute tuberculosis or catarrhal pneumonia. Moreover, diarrhoea and even headache may be absent in typhoid fever. But by the tenth or the fifteenth day the diagnosis in most cases becomes easy; still it must be admitted that now and then we encounter perplexing cases of typhoid fever, which render the diagnosis between it and tuberculosis or catarrhal pneumonia doubtful for a much longer time; the

thirtieth day once passed, if the disease should have remained so long undetermined, is in all probability, not typhoid fever, for this usually ceases either before or at this time. Yet it is well known that typhoid fever occasionally lasts six weeks, or longer. In children the diagnosis between typhoid fever and acute miliary tuberculosis is often extremely difficult, the symptoms of typhoid being in some cases so ill defined that many good observers refuse to consider them to denote typhoid fever, and call them simple continued fever of children. Probably many of these cases are acute tuberculosis, the deposit ceasing and the tubercles becoming obsolescent and harmless. Of course the diagnosis is difficult only when, in acute miliary tuberculosis and catarrhal pneumonia, there are no physical signs nor characteristic symptoms.

Again, after typhoid fever, a period of fever may set in lasting six weeks or two months, the temperature becoming almost natural, and then daily rising higher and higher to  $101^{\circ}$ ,  $102^{\circ}$  and  $103^{\circ}$ , and after about four or five days again gradually falling, this course being often repeated. Occurring after typhoid fever such a temperature does not show lung disease; indeed this condition may co-exist with a clean tongue, increase of appetite and weight, and a steady amendment of the health.

It thus appears that the temperature alone may enable us to diagnose tubercle or catarrhal pneumonia in those cases where the physical signs and symptoms are absent, or are too indefinite to assist the diagnosis.

The following typical instances illustrate the usefulness of the thermometer in doubtful cases of phthisis.

A patient is taken rather suddenly ill. His face is flushed eyes bright, pulse quick. The temperature is very high.

There is no headache, no delirium, no diarrhoea. So weak is he that he is confined to bed. At the end of ten or fifteen days he remains much in the same plight but has grown weaker. His tongue has become dry. There are no typhoid spots, no diarrhoea and the stomach is not distended. He has no cough nor expectoration and there are no physical signs in the chest. He continues in the same state for a month or five weeks when distinct physical signs at the apices of the lungs appear accompanied by expectoration and possibly slight haemoptysis. Soon he begins to improve, the fever grows daily less severe, his tongue becomes clean, appetite slowly returns, cough diminishes, and at last both cough and expectoration cease. All moist chest sounds disappear, and at the expiration of about two months the temperature becomes natural, strength returns, weight increases although there will always remain evidences of consolidation at the apices of his lungs.

A woman, between 30 and 35 years of age, fails slightly in health, complains of slight weakness, is soon tired, but is never ill enough to be confined to bed. Her appetite is rather bad. There is a trifling cough and perhaps on one or two occasions the expectoration of a slight streak of bright coloured blood, so slight and so seldom repeated, that it is hoped the blood may come from the mouth or throat. There may be a strong family predisposition to phthisis. No physical signs are apparent; yet the temperature, rising nightly to  $101^{\circ}$  or  $102^{\circ}$  Fah. declares the true nature of the disease, which perhaps in the course of some months is rendered too evident by decided physical signs. How important it is to detect this early and slight stage of the disease!

7. By means of the temperature we can diagnose tubercu-

losis, even, when during the whole course of the disease there are no physical signs indicative of tubercular deposit in any of the organs of the body, and when the symptoms are quite inadequate to enable us to form such a diagnosis. Thus we commonly meet with cases of acute miliary tuberculosis in children, where, throughout the whole course of the disease, the only guiding symptom is preternatural heat of the body, except perhaps a small amount of sonorous or sub-mucous rhonchus, and yet after death most of the organs of the body are found studded with miliary tubercles. Again, we occasionally meet with patients, generally among children ten or twelve years old, who complain of pain in the head, and whose manner is peculiar, being semi-idiotic, in whom the temperature daily rises considerably for weeks or months, where after death small masses of yellow tubercle are found the size of a large pea or bean, embedded in the substance of the brain, with sometimes miliary tubercles scattered through the thoracic and abdominal organs.

The following instance, in which the temperature rose daily to about 102° Fah. the whole time she was under observation, serves to show the great diagnostic value of the temperature in certain obscure cases.

Mary Norton, æt. 48, admitted into University College Hospital, August 27th, 1864.

About a year ago she became the subject of sub-acute rheumatism, the pains attacking all her limbs, and the loins. The pains are worse during the wet weather. There is no history of syphilis.

About a month ago she was seized with attacks of spasmodic contractions of the fingers; at such times the fingers became strongly flexed on the hand. With much trouble she

could force the fingers open without pain. On letting them go they would immediately "snap together again." At the time the fingers were thus contracted her face was always strongly drawn to the left side, and she suffered from cramp-like pains in her left leg. These attacks lasted usually about five minutes, and occurred sometimes even five or six times in an hour. They continued about a week, and then one morning she found she had lost, to a great extent, the use of her left arm and hand and leg. This loss of the power of the left side has been getting worse since. After the paralysis the convulsive movements ceased, but she continued to have cramp-like pains in her left leg, which, indeed, have become worse daily.

From the very commencement of the disease she has suffered from severe paroxysmal pain in the front of the head, passing through from temple to temple, so bad at times that she "could not see." She has had no fits, has never lost consciousness, and is free from delirium. Appetite has been very bad. She has never suffered from vomiting.

On August 30th the following notes were taken:—Lying on back. Expression easy. Some flattening of the left half of the upper lip, and of left side of face generally. On laughing or talking, the left side of the face moves much less than the right; can, however, close both eyes equally. Masseters act equally. Protrudes tongue straight. No ptosis. No strabismus. Pupils of medium size—equal. Sensation appears to be equal on both sides of the face.

Can only just raise the left arm from the bed; moves the left leg better, but has much less power in it than in the right. She cannot stand. She states that the paralysis gets worse.

Slight rigidity of the biceps muscle; this can easily be overcome without causing her any pain. Fingers of left hand slightly flexed. Sensation impaired in left arm, though not lost; it improves very much at about the shoulder, and at this place is as good as on the right side. Left leg, as regards sensation, in about the same condition as the arm. No rigidity of the left leg.

Muscles of the left much smaller and more flabby than those of the right arm. She states that the muscles have wasted very rapidly. Under the influence of galvanism the muscles of both arms act about equally.

Tongue clean. Slight thirst. Appetite very bad. Nausea, but no vomiting after food. Bowels open.

Pain in head continues, still paroxysmal. Intelligence good.

Pulse rather stronger in right than left wrist.

September 2nd. Looks more anxious. Whimpers and cries very readily. For the last day or so had complained of very severe pain across the forehead; she gets worse towards night. Sleeps badly at night, but does not wander.

Thinks her arm more useless than on admission; leg and face are about the same. Had some twitching of the face yesterday and the night before last; none in arm or leg. No ptosis; no strabismus. Pupils equal, and of the medium size. Masseters contract equally. No rigidity of the left arm or leg.

Tongue furred; moist. No thirst; appetite very bad. Bowels open. No sickness, but retches much after food. No difficulty in swallowing.

No shortness of breath. Pulse 84, regular. No fulness of jugular veins. No pitting of legs.

Has had an abundant discharge of blood from the vagina since the 27th.

Seems to be intelligent and answers questions correctly.

Lungs healthy. Heart apex cannot be felt; at base, systolic murmur caught louder at second right than second left cartilage; weak at both. None heard at the apex. Abdomen. Distinct impulse seen between umbilicus and ensiform cartilage, of maximum intensity midway between these two points. Impulse readily felt over the heaving part, but not expansile. No tumour to be felt. No pain at this point. A distinct systolic murmur, increased by pressure, audible. No murmur with the second sound.

On September 7th, patient getting thinner and weaker. Paralysis of left side of face not so marked; paralysis of left arm also much improved. Can raise it easily from the bed, and move it backwards and forwards; the power, however, still much impaired. Can also move her leg better. Had some twitching of face yesterday. Pain in head less severe. Complains of some tenderness on the top of her head; no swelling can be felt, nor redness seen. Pulsation of the abdomen less. Pulse 98, regular. Appetite almost *nil* during the last five days.

September 9th. For the last three or four days the patient's manner has been strange; has been taking no notice of objects around her. When roused talks in an incoherent manner. Frequently attempts to get out of bed—evidently delirious. When the thermometer is placed in her axilla, will not remain quiet, but turns and rolls about the bed. Evidently emaciates. Lips rather dry. Tongue dry. Left arm in much the same condition as at last report. No rigidity of left arm. When arms tested by galvanism the

muscles of right side move much more than left. No ptosis. No strabismus. Paralysis of face much the same. Vaginal discharge quite ceased.

Died September 12th.

The *post-mortem* showed aortic and mitral valves quite competent. Heart's substance healthy. Some dilatation of the aorta :  $2\frac{1}{2}$  inches above aortic valves, it measures  $4\frac{1}{2}$  inches transversely.

Lungs contained grey granulations scattered from base to apex. Some of these hard, and contain much pigment, and probably obsolescent. By far the larger quantity, however, recent. Some granulations on pleura.

Spleen contained a few masses of yellow tubercle.

Grey granulations seen in the peritoneum, covering the liver. None found in the rest of the peritoneum. Grey granulations also found in substance of the liver. Some grey granulations seen on the surface and in the centre of the kidneys. Some ulcers and enlarged glands in the small intestines. Mesenteric glands contain much tubercle. Abdominal aorta healthy.

Brain. Surface of brain much injected ; not more so posteriorly than anteriorly. Convolutions not flattened. No excess of serum in the meshes of the pia mater ; no inflammatory thickening. On the surface of the right hemisphere, imbedded in the substance of the brain, two round masses of tubercle about the size of a large pea are found ; brain substance around injected and softened. Section of brain. At the junction of the middle and posterior third of cerebrum on the right side, and situated on the surface, involving chiefly the grey matter, there is an aggregation of similar masses of tubercle ; the brain substance around is injected.

A few similar scattered bodies are seen in the anterior part of the section. In the posterior part of the left section are one or two similar bodies at the surface of the brain. On making a deeper horizontal section some of these bodies were seen imbedded in the middle of the white substance. Fluid in ventricles somewhat in excess. Septum lucidum rather soft. Foramina of Monro and the descending ventricles rather dilated. Base of brain. Membranes a little thickened at the circle of Willis, and in Sylvian fissure. No tubercle here. No tubercle seen pressing on either crus from without. One mass of tubercle similar to those mentioned observed in the posterior surface of the right hemisphere. One mass found in the right thalamus opticus, and another in right corpus striatum. Left thalamus opticus and corpus striatum healthy. In the centre of the pons is seen one of these bodies embedded completely in the brain substance. This is situated in the upper part of the pons, and rather inclined to the left than right side of the middle line. Another also found in the centre of the right crus cerebri. Cerebellum healthy.

8. It is probable that by means of thermometer we can decide when the tuberculosis or catarrhal pneumonia has ceased; and that any existing physical signs are due to obsolescent tubercle, or to the product of previous catarrhal pneumonia and the chronic thickening of the lung tissue around and between the diseased products.

Admitting an elevation of temperature in all cases of tuberculosis and catarrhal pneumonia, it follows that if the temperature is normal we may conclude that the patient is free from these diseases. Further, with patients having physical signs indicating marked consolidation of the apices of the lungs,

we are justified in stating that if due to tuberculosis or catarrhal pneumonia these diseases are in abeyance, except indeed, when they are progressing at so slow a rate as not to affect the temperature. *Post-mortems* abundantly prove the truth of this statement.

For the most part it is easy to discriminate these forms of phthisis. To speak first of the two febrile forms—the temperature affords us no assistance in distinguishing between them; and the diagnosis must be made by means of the physical signs and symptoms.

Thus, if the lung breaks up very rapidly this is certainly indicative of catarrhal or scrofulous pneumonia; and this, if even mixed with, or secondary to, tubercle, constitutes the most important element in the case. If the physical signs are localized the disease in all likelihood is catarrhal pneumonia, and this probability is much strengthened if there has been much or even slight haemoptysis.

On the other hand, if the deposition appears to be scattered throughout the lungs, there being in fact no localization of the disease, and the patient is a child, we have probably to deal with a case of disseminated tubercle. It must, however, be remembered that in the early stage of catarrhal pneumonia there may be no physical signs; and in such cases the diagnosis is difficult and must depend mainly on the age of the patient and the presence of haemoptysis.

The diagnosis of fibroid phthisis is generally more easy. If the disease has lasted some weeks we may safely conclude that a portion of the lung round the cavities and consolidated tissue has become indurated and that if the temperature is still high we have a mixture of the acute and chronic forms. If the temperature is natural, but there are well marked

evidences of lung disease showing consolidation, then we can safely conclude that the disease is of old standing and progressing either not at all or very slowly, and that the consolidation is due to fibroid thickening of the lung associated with cheesy masses, the obsolescent stage, in fact, of catarrhal pneumonia.

Suppose the case with signs of decided consolidation has lasted a considerable time with the temperature only slightly raised, we may here safely assume the existence of much fibroid induration of the lung, with either a small amount of catarrhal pneumonia or a scanty deposition of tubercle or slight irritation of the walls of the pulmonary cavities.

Though the temperature affords a very precise measure of the activity of the disease, still in forming a prognosis we must be careful not to overrate the importance of the temperature and undervalue other circumstances. The temperature as a measure of the activity of the disease is a cardinal element in the prognosis; still in many cases though the temperature is very high, the disease after a time declines, and the patient recovers completely. In forming an estimate of the probability of recovery, or of the time the patient is likely to live, we must likewise pay regard to the appetite and power of assimilation. It is generally held that while the appetite remains good, the patient either does not lose weight, or loses but little, so that notwithstanding the presence of even a very high temperature, we may reasonably assume that the patient may live some time; though the long continuance of the disease gives but little hope of recovery. In some few cases, however, although the patient eats well, either he fails to digest or to assimilate the food, for he loses flesh. Thus it is necessary to consider the varying weight of the patient as well

as his appetite. Not uncommonly the appetite or power of assimilation suddenly fails, and then the patient rapidly declines. Of course, even if the appetite and assimilation remain good, the patient may be carried off by haemoptysis, diarrhoea, and acute illness. Again, if the disease attacks other parts than the lungs, the prognosis becomes much less hopeful. Thus no form of phthisis is so intractable as that accompanied by laryngeal disease. Here, though the temperature may be only slightly elevated to  $101^{\circ}$  or  $102^{\circ}$  Fah., and the physical signs and symptoms show that the lungs are not severely implicated, yet the appetite and assimilation become so impaired that these patients quickly waste away. Again, in a case complicated with ulceration of the intestines, the patient speedily emaciates, generally no doubt through exhaustion from diarrhoea. We meet too with chronic cases manifesting but little lung mischief, perhaps consolidation only of one or both apices, with the temperature natural or only slightly raised, and yet the breathing is seriously impaired, the patient suffering much from shortness of breath on the slightest exertion, sometimes to the extent of orthopnoea. In a case like this no doubt the phthisis often accompanies emphysema, still the shortness of breath, etc., is evidently not owing to this disease. Even in non-febrile cases the appetite and assimilation may be so impaired that the patient sinks. It need scarcely be said that intercurrent diseases so common in fibroid lung, as albuminoid degeneration or fatty kidney, make the prognosis excessively serious.

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